



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,436	09/01/2006	Timo Heino	0365-068SPUS1	1746
2292 7590 05/04/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER YOUNG, NATASHA E				
ART UNIT		PAPER NUMBER		
1797				
NOTIFICATION DATE		DELIVERY MODE		
05/04/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/591,436

**Applicant(s)**

HEINO ET AL.

**Examiner**

NATASHA YOUNG

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 19-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 3, 2009 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19-21, 23-26, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamalainen et al (US 5,627,243) in view of Rhee et al (US 4,933,191).

Regarding claim 19, Hamalainen et al discloses a method of producing polymers in a gas phase polymerization reactor, the reactor having an elongated reactor body, defined by reactor walls, and an essentially vertically disposed central axis, the reactor comprising an upper part, in which a reactor bed of fluidized catalyst particles can be formed, and a lower part, in which monomer gas can be introduced, said upper and said lower parts being separated by a distribution plate having an annular opening along the reactor walls which promotes distribution into the fluidized bed of monomers flowing from the lower part into the upper part, wherein said method comprises:

- feeding a gas stream containing one or more monomers into the lower part of the reactor;
- polymerizing the monomers on the catalyst particles to form a polymer;
- wherein the gas stream is fed into the lower part of the reactor along the periphery of the inside of the reactor walls past the abutting distribution plate to prevent the formation of stagnant zones in the fluidized bed at the reactor walls in the vicinity of the distribution plate, and
- a single distribution plate is used in the reactor body (see column 5, line 49 through column 6, line 10), wherein at least 30% of the total flow of gas through the

distribution plate is conducted along the periphery of the inside of the reactor walls, since the size and number of perforation holes is selected so that only a minor portion of the circulating gas flow passes through the flow control element while the rest flow is directed sideways (see column 3, lines 4-26).

Hamalainen et al does not explicitly disclose:

- withdrawing unreacted monomers; and
- recovering the polymer.

Rhee et al discloses:

- withdrawing unreacted monomers; and
- recovering the polymer (see column 7, lines 39-65).

Regarding claim 20, Hamalainen et al discloses a method wherein a gas stream is conducted along at least 80% of the periphery of the inside of the reactor walls abutting the distribution plate (see column 3, lines 4-26).

Regarding claim 21, Hamalainen et al discloses a method wherein a gas stream is conducted along 90-100 % of the periphery of the inside of the reactor walls abutting the distribution plate (see column 3, lines 4-26).

Regarding claims 23 and 28-29, Hamalainen et al does not disclose a method wherein the flow rate of the gas stream conducted along the inside of the reactor wall is about 1 to 200 cm/s, about 10 to 100 cm/s, and about 30 to 70 cm/s.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a method wherein the flow rate of the gas stream conducted along the inside of the reactor wall is about 1 to 200 cm/s, about 10 to 100

cm/s, and about 30 to 70 cm/s, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.95 (II-A)).

Additionally, Rhee et al discloses the flow rate of the gas stream conducted along the inside of the reactor wall is about 1 to 200 cm/s, about 10 to 100 cm/s, and about 30 to 70 cm/s (see Table 3), which discloses the operating conditions such that the superficial gas velocity in the fluidized bed is 2.2 ft/sec (67.056 cm/sec).

Regarding claim 24, Hamalainen et al discloses a method wherein the distribution plate has openings, which are not covered by overcaps to allow for free flow of gas through the openings from the lower part of the reactor into the upper part (see figure 1 and column 5, line 49 through column 6, line 10), which does not disclose overcaps.

Regarding claim 25, Hamalainen et al discloses a method wherein the openings of the distribution plate are essentially circular in cross-section (see figure 1 and column 5, line 49 through column 6, line 10).

Regarding claim 26, Hamalainen et al a method wherein the part of the gas stream conducted along the inside reactor walls forms 40 %, of the total flow of gas through the plate, since the size and number of perforation holes is selected so that only a minor portion of the circulating gas flow passes through the flow control element while the rest flow is directed sideways (see column 3, lines 4-26).

Regarding claim 30, Hamalainen et al discloses a method wherein a gas stream is conducted along 90-100 % of the periphery of the inside of the reactor walls abutting

the distribution plate, since the size and number of perforation holes is selected so that only a minor portion of the circulating gas flow passes through the flow control element while the rest flow is directed sideways (see column 3, lines 4-26).

Claims 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamalainen et al (US 5,627,243) and Rhee et al (US 4,933,191) as applied to claim 19 above, and further in view of Yamamoto et al (US 5,753,191) and Grott et al (US 5,837,208).

Regarding claims 22 and 27, Hamalainen et al and Rhee et al do not disclose a method wherein the annular opening has a width of 2 to 20 mm and wherein the annular opening has a width of 2 to 10 mm.

Yamamoto et al discloses a distribution plate having a number of gas passage holes (20) where the holes (20) perforated in the outer peripheral portion have an average diameter which is larger than the average diameter of the holes (2) perforated in the inner peripheral portion to provide uniform gas flow (see column 6, lines 1-53).

Grott et al discloses an annular gap (17) between the first distribution tray (21) and the vessel wall (1) where the vapor flows (see Abstract and figure 1).

It would have been an obvious matter of design choice to have the annular opening has a width of 2 to 20 mm and wherein the annular opening has a width of 2 to 10 mm, since applicant has not disclosed that having the annular opening has a width of 2 to 20 mm and wherein the annular opening has a width of 2 to 10 mm solves any stated problem or is for any particular purpose and it appears that the invention would

perform well with the annular opening has a width of 2 to 20 mm and wherein the annular opening has a width of 2 to 10 mm.

It would have been obvious to choose an annular gap between the distribution plate and the reactor wall from a finite number of identified, predictable solution for ways of ways to providing uniform gas flow through the distribution plate, i.e., it would have been "obvious to try" the specific structure of an annular gap between the distribution plate and the reactor wall, larger holes in the outer peripheral portion than the inner peripheral portion, or both to provide uniform gas flow through the distribution plate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Hamalainen et al with the teachings of Yamamoto et al and Grott et al such that a method wherein the annular opening has a width of 2 to 20 mm and wherein the annular opening has a width of 2 to 10 mm in order to provide uniform gas flow.

Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamalainen et al (US 5,627,243) in view of Veariel et al (US 6,838,532 B2), Yamamoto et al (US 5,753,191), and Grott et al (US 5,837,208).

Regarding claims 31-34, Hamalainen et al discloses an apparatus for producing polymers by gas phase polymerization, comprising: an elongated reactor body, defined by reactor walls, said reactor body having an essentially vertically disposed central axis (see column 2, line 44 through column 3, line 3), said reactor body comprising: an upper part (12), in which a reactor bed of fluidized catalyst particles can be formed, and a lower part (13), in which monomer gas can be introduced, said upper and said lower



parts being separated by a distribution plate (15) which promotes distribution into the fluidized bed of monomers flowing from the lower part into the upper part; at least one feed nozzle (14) in the lower part of the reactor for introducing a gas stream containing monomers into the lower part of the reactor; a discharge device in the upper part of the reactor for recovering polymer product from the reactor, wherein the distribution plate is fitted to allow for the flow of at least 30% of the total flow of gas stream fed into the lower part of the reactor along the inside of the reactor walls past the distribution plate, and wherein a single distribution plate is fitted inside the reactor body (see figure 1; column 4, lines 39-50; and column 5, line 49 through column 6, line 10), since the size and number of perforation holes is selected so that only a minor portion of the circulating gas flow passes through the flow control element while the rest flow is directed sideways (see column 3, lines 4-26); and wherein the openings of the distribution plate have a circular cross-section transversally to the central axis of the reactor (see Abstract).

Hamalainen et al does not disclose an outlet nozzle in the upper part of the reactor for recovering unreacted monomers; wherein the distribution plate is fitted inside the reactor body in such a way that an essentially annular opening is formed between the periphery of the plate edge and the reactor wall; and wherein the reactor body has a circular cross-section transversal to the central axis and the distribution plate has a circular periphery, the diameter of the distribution plate being 2 to 20 mm smaller than the inner diameter of the reactor body.

Veariel et al discloses a discharge outlet nozzle (see claims 11, 18 and 25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Hamalainen et al with the teachings of Veariel et al such that the apparatus comprises an outlet nozzle in the upper part of the reactor for recovering unreacted monomers for the predictable result of control flow of discharge leaving the reactor.

Yamamoto et al discloses a distribution plate having a number of gas passage holes (20) where the holes (20) perforated in the outer peripheral portion have an average diameter which is larger than the average diameter of the holes (2) perforated in the inner peripheral portion to provide uniform gas flow (see column 6, lines 1-53).

Grott et al discloses an annular gap (17) between the first distribution tray (21) and the vessel wall (1) where the vapor flows (see Abstract and figure 1).

It would have been an obvious matter of design choice to have the annular opening has a width of 2 to 20 mm, since applicant has not disclosed that having the annular opening has a width of 2 to 20 mm solves any stated problem or is for any particular purpose and it appears that the invention would perform well with the annular opening has a width of 2 to 20 mm.

It would have been obvious to choose an annular gap between the distribution plate and the reactor wall from a finite number of identified, predictable solution for ways of ways to providing uniform gas flow through the distribution plate, i.e., it would have been "obvious to try" the specific structure of an annular gap between the distribution plate and the reactor wall, larger holes in the outer peripheral portion than the inner peripheral portion, or both to provide uniform gas flow through the distribution plate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Hamalainen et al with the teachings of Yamamoto et al and Grott et al such that an apparatus wherein the reactor body has a circular cross-section transversal to the central axis and the distribution plate has a circular periphery, the diameter of the distribution plate being 2 to 20 mm smaller than the inner diameter of the reactor body, and wherein the openings of the distribution plate have a circular cross-section transversally to the central axis of the reactor in order to provide uniform gas flow.

### ***Response to Arguments***

Applicant's arguments with respect to claims 19-34 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./  
Examiner, Art Unit 1797

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797